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## NOTICE OF ALLOWANCE AND FEE(S) DUE

24374 7590 05/01/2008

VOLPE AND KOENIG, P.C.  
DEPT. ICC  
UNITED PLAZA, SUITE 1600  
30 SOUTH 17TH STREET  
PHILADELPHIA, PA 19103

EXAMINER

TORRES, JUAN A

ART UNIT

PAPER NUMBER

2611

DATE MAILED: 05/01/2008

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/791,244	03/02/2004	Rui Yang	1-2-0455.1US	3614
TITLE OF INVENTION: REDUCED COMPLEXITY SLIDING WINDOW BASED EQUALIZER				

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1440	\$300	\$0	\$1740	08/01/2008

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. **PROSECUTION ON THE MERITS IS CLOSED.** THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN **THREE MONTHS** FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. **THIS STATUTORY PERIOD CANNOT BE EXTENDED.** SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

## HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

**IMPORTANT REMINDER:** Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

# **PART B - FEE(S) TRANSMITTAL**

**Complete and send this form, together with applicable fee(s), to:** **Mail** **Mail Stop ISSUE FEE**  
**Commissioner for Patents**  
**P.O. Box 1450**  
**Alexandria, Virginia 22313-1450**  
**or Fax** **(571)-273-2885**

**INSTRUCTIONS:** This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

24374 7590 05/01/2008  
**VOLPE AND KOENIG, P.C.**  
**DEPT. ICC**  
**UNITED PLAZA, SUITE 1600**  
**30 SOUTH 17TH STREET**  
**PHILADELPHIA, PA 19103**

## **Certificate of Mailing or Transmission**

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10791.244	03/02/2004	Rui Yang	I-2-0455.1US	3614
TITLE OF INVENTION: REDUCED COMPLEXITY SLIDING WINDOW BASED EQUALIZER				

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1440	\$300	\$0	\$1740	08/01/2008

EXAMINER	ART UNIT	CLASS-SUBCLASS
TORRES, JUAN A	2611	375-346000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.  
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a **Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 \_\_\_\_\_  
 (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 \_\_\_\_\_  
 3 \_\_\_\_\_

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee  
☐ Publication Fee (No small entity discount permitted)  
☐ Advance Order - # of Copies \_\_\_\_\_

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.  
☐ Payment by credit card. Form PTO-2038 is attached.  
☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number \_\_\_\_\_ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature \_\_\_\_\_ Date \_\_\_\_\_  
 Typed or printed name \_\_\_\_\_ Registration No. \_\_\_\_\_

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/791,244

03/02/2004

Rui Yang

I-2-0455.IUS

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PHILADELPHIA, PA 19103

## Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 751 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 751 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

**Notice of Allowability****Application No.**

10/791,244

**Applicant(s)**

YANG ET AL.

**Examiner**

JUAN A. TORRES

**Art Unit**

2611

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Request for Continued Examination (RCE) filed on 01/16/2008.
2. ☒ The allowed claim(s) is/are 2-6, 8-12, 14-18, 20-24 and 26-32 (renumbered 1-27).
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some\* c) ☐ None of the:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.  
(a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached  
1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.  
(b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.  
**Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08),  
Paper No./Mail Date 01/16/2008 and 04/07/2008
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_.
7. ☐ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_.



## **DETAILED ACTION**

### ***Information Disclosure Statement***

#### Regarding information disclosure statement filed on 01/16/2008.

The information disclosure statement filed 01/16/2008 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent listed that is not in the English language. It has been placed in the application file, but the information referred to therein has not been considered.

a) References 122, 123 and 123 have not been considered because they do not include a concise explanation of the relevance.

b) Reference 112 (see left column) has not been found in the DS documents.

c) Reference 164 has been deleted by the Examiner because it is the same than reference 163.

d) Reference 182 has been deleted by the Examiner because it is the same than reference 181.

e) Reference 188, the Examiner indicates that is 2 pages long.

f) Reference 193, the Examiner indicates that is 2 pages long.

g) Reference 194, the Examiner has changed the range of pages to fix a typo.

#### Regarding information disclosure statement filed on 04/07/2008.

a) Reference 112 (see left column) has not been changed to fix a typo in the patent number.

c) Reference 164 has been deleted by the Examiner because it is the same than reference 163.

d) Reference 182 has been deleted by the Examiner because it is the same than reference 181.

e) Reference 188, the Examiner indicates that is 2 pages long.

f) Reference 194, the Examiner indicates that is 2 pages long.

g) Reference 195, the Examiner has changed the range of pages to fix a typo.

***Allowable Subject Matter***

Claims 2-6, 8-12, 14-18, 20-24 and 26-32 (renumbered 1-27) are allowed.

The following is an examiner's statement of reasons for allowance: Claims 2-6, 8-12, 14-18, 20-24 and 26-32 (renumbered 1-27) are allowed because a comprehensive search of prior art failed to teach, either alone or in combination, a method for data estimation in a wireless communications system, the method comprising: producing a received vector; determining a past, a center and a future portion of a channel estimate matrix for a desired portion of the data of the received vector, the past portion associated with a portion of the received signal prior to the desired portion of the data, the future portion associated with a portion of the received vector after the desired portion of the data and the center portion associated with a portion of the received vector associated with the desired data portion, estimating the desired portion of the data without effectively truncating detected data using a minimum mean square error algorithm having inputs of the center portion of the channel estimate matrix and a portion of the received vector; using the past and future portions of the channel estimate

matrix for adjusting factors in the minimum mean square error algorithm, and adjusting the received vector prior to input into the minimum mean square error algorithm using the past portion of the channel estimate matrix and data previously estimated for a portion of the received vector associated with the past portion of the channel estimate matrix; a method for data estimation in a wireless communications system, the method comprising producing a received vector, determining a past, a center and a future portion of a channel estimate matrix for a desired portion of the data of the received vector, the past portion associated with a portion of the received signal prior to the desired portion of the data, the future portion associated with a portion of the received vector after the desired portion of the data and the center portion associated with a portion of the received vector associated with the desired data portion, estimating the desired portion of the data without effectively truncating detected data using a minimum mean square error algorithm having inputs of the center portion of the channel estimate matrix and a portion of the received vector, using the past and future portions of the channel estimate matrix for adjusting factors in the minimum mean square error algorithm, and producing a noise factor using the prior channel estimate matrix, the future channel estimate matrix and an auto correlation of the noise and the inputs into the minimum mean square error algorithm are the noise factor, the center portion of the channel estimate matrix and the portion of the received vector; a wireless transmit/receive unit comprising a receiver component configured to produce a received vector, a matrix determination component configured to determine a past, a center and a future portion of a channel estimate matrix of a desired portion of data of the received



vector, the past portion associated with a portion of the received signal prior to the desired portion of the data, the future portion associated with a portion of the received vector after the desired portion of the data and the center portion associated with a portion of the received vector associated with the desired data portion, a data estimation component configured to estimate the desired portion of the data without effectively truncating detected data, the estimating the desired portion of the data uses a minimum mean square error algorithm having inputs of the center portion of the channel estimate matrix and a portion of the received vector, the data estimation component configured to use the past and future portions of the channel estimate matrix for adjusting factors in the minimum mean square error algorithm, and the data estimation component configured to adjust the received vector prior to input into the minimum mean square error algorithm using the past portion of the channel estimate matrix and data previously estimated for a portion of the received vector associated with the past portion of the channel estimate matrix; a wireless transmit/receive unit comprising a receiver component configured to produce a received vector, a matrix determination component configured to determine a past, a center and a future portion of a channel estimate matrix of a desired portion of data of the received vector, the past portion associated with a portion of the received signal prior to the desired portion of the data, the future portion associated with a portion of the received vector after the desired portion of the data and the center portion associated with a portion of the received vector associated with the desired data portion, a data estimation component configured to estimate the desired portion of the data without effectively truncating detected data, the estimating

the desired portion of the data uses a minimum mean square error algorithm having inputs of the center portion of the channel estimate matrix and a portion of the received vector, the data estimation component configured to use the past and future portions of the channel estimate matrix for adjusting factors in the minimum mean square error algorithm, and a component configured to produce a noise factor using the prior channel estimate matrix, the future channel estimate matrix and an auto correlation of the noise and the inputs into the minimum mean square error algorithm are the noise factor, the center portion of the channel estimate matrix and the portion of the received vector; a wireless transmit/receive unit configured to receive at least one signal and to produce a received vector therefrom, the wireless transmit/receive unit comprising a channel estimation matrix device configured to determine a past, a center and a future portion of a channel estimate matrix of a desired portion of data of the received vector, the past portion associated with a portion of the received signal prior to the desired portion of the data, the future portion associated with a portion of the received vector after the desired portion of the data and the center portion associated with a portion of the received vector associated with the desired data portion, a minimum mean square error device configured to estimate the desired portion of the data without effectively truncating detected data using a minimum mean square error algorithm having inputs of the center portion of the channel estimate matrix and a portion of the received vector, wherein the past and future portions of the channel estimate matrix are used for adjusting factors in the minimum mean square error algorithm, and an adjustment device configured to adjust the received vector prior to input into the minimum mean

square error device by using the past portion of the channel estimate matrix and data previously estimated for a portion of the received vector associated with the past portion of the channel estimate matrix; a wireless transmit/receive unit configured to receive at least one signal and to produce a received vector therefrom, the wireless transmit/receive unit comprising a channel estimation matrix device configured to determine a past, a center and a future portion of a channel estimate matrix of a desired portion of data of the received vector, the past portion associated with a portion of the received signal prior to the desired portion of the data, the future portion associated with a portion of the received vector after the desired portion of the data and the center portion associated with a portion of the received vector associated with the desired data portion, a minimum mean square error device configured to estimate the desired portion of the data without effectively truncating detected data using a minimum mean square error algorithm having inputs of the center portion of the channel estimate matrix and a portion of the received vector, wherein the past and future portions of the channel estimate matrix are used for adjusting factors in the minimum mean square error algorithm, and a noise factor device configured to produce a noise factor using the prior channel estimate matrix, the future channel estimate matrix and an auto correlation of the noise and the inputs into the minimum mean square error algorithm are the noise factor, the center portion of the channel estimate matrix and the portion of the received vector; a base station comprising a receiver component configured to produce a received vector, a matrix determination component configured to determine a past, a center and a future portion of a channel estimate matrix of a desired portion of data of

the received vector, the past portion associated with a portion of the received signal prior to the desired portion of the data, the future portion associated with a portion of the received vector after the desired portion of the data and the center portion associated with a portion of the received vector associated with the desired data portion, a data estimation component configured to estimate the desired portion of the data without effectively truncating detected data, the estimating the desired portion of the data uses a minimum mean square error algorithm having inputs of the center portion of the channel estimate matrix and a portion of the received vector, the data estimation component configured to use the past and future portions of the channel estimate matrix for adjusting factors in the minimum mean square error algorithm, and the data estimation component configured to adjust the received vector prior to input into the minimum mean square error algorithm using the past portion of the channel estimate matrix and data previously estimated for a portion of the received vector associated with the past portion of the channel estimate matrix; a base station comprising a receiver component configured to produce a received vector, a matrix determination component configured to determine a past, a center and a future portion of a channel estimate matrix of a desired portion of data of the received vector, the past portion associated with a portion of the received signal prior to the desired portion of the data, the future portion associated with a portion of the received vector after the desired portion of the data and the center portion associated with a portion of the received vector associated with the desired data portion, a data estimation component configured to estimate the desired portion of the data without effectively truncating detected data, the estimating

the desired portion of the data uses a minimum mean square error algorithm having inputs of the center portion of the channel estimate matrix and a portion of the received vector the data estimation component configured to use the past and future portions of the channel estimate matrix for adjusting factors in the minimum mean square error algorithm, and a component configured to produce a noise factor using the prior channel estimate matrix, the future channel estimate matrix and an auto correlation of the noise and the inputs into the minimum mean square error algorithm are the noise factor, the center portion of the channel estimate matrix and the portion of the received vector; a base station configured to receive at least one signal and to produce a received vector therefrom, the wireless transmit/receive unit comprising a channel estimation matrix device configured to determine a past, a center and a future portion of a channel estimate matrix of a desired portion of data of the received vector, the past portion associated with a portion of the received signal prior to the desired portion of the data, the future portion associated with a portion of the received vector after the desired portion of the data and the center portion associated with a portion of the received vector associated with the desired data portion, a minimum mean square error device configured to estimate the desired portion of the data without effectively truncating detected data using a minimum mean square error algorithm having inputs of the center portion of the channel estimate matrix and a portion of the received vector, wherein the past and future portions of the channel estimate matrix are used for adjusting factors in the minimum mean square error algorithm, and an adjustment device configured to adjust the received vector prior to input into the minimum mean square error device by

using the past portion of the channel estimate matrix and data previously estimated for a portion of the received vector associated with the past portion of the channel estimate matrix; a base station configured to receive at least one signal and to produce a received vector therefrom, the wireless transmit/receive unit comprising a channel estimation matrix device configured to determine a past, a center and a future portion of a channel estimate matrix of a desired portion of data of the received vector, the past portion associated with a portion of the received signal prior to the desired portion of the data, the future portion associated with a portion of the received vector after the desired portion of the data and the center portion associated with a portion of the received vector associated with the desired data portion, a minimum mean square error device configured to estimate the desired portion of the data without effectively truncating detected data using a minimum mean square error algorithm having inputs of the center portion of the channel estimate matrix and a portion of the received vector, wherein the past and future portions of the channel estimate matrix are used for adjusting factors in the minimum mean square error algorithm; and a noise factor device configured to produce a noise factor using the prior channel estimate matrix, the future channel estimate matrix and an auto correlation of the noise and the inputs into the minimum mean square error algorithm are the noise factor, the center portion of the channel estimate matrix and the portion of the received vector; an integrated circuit comprising an input configured to receive a received vector, a channel estimation device producing a prior, center and future portion of a channel response matrix using the received vector, a future noise auto-correlation device for receiving the future portion of the

channel response matrix and producing a future noise auto-correlation factor, a noise auto-correlation device producing a noise auto-correlation factor using the received vector, a summer for summing the future noise auto-correlation factor with the noise auto-correlation factor, a past input correction device for receiving the prior portion of the channel response matrix and prior detected data to produce a past input correction factor, a subtractor subtracting the past input correction factor from the received vector, and a minimum mean square error device for receiving an output of the summer, an output of the subtractor and the center portion of the channel estimate matrix, the minimum mean square error device producing estimated data; and an integrated circuit comprising an input configured to receive a received vector, a channel estimation device producing a prior, center and future portion of a channel response matrix using the received vector, a noise auto-correlation correction device for receiving the future and prior portions of the channel response matrix and producing a noise auto-correlation correction factor, a noise auto-correlation device producing a noise auto-correlation factor using the received vector, a summer for summing the noise auto-correlation factor with the noise auto-correlation correction factor; a minimum mean square error device for receiving an output of the summer, the center portion of the channel estimate matrix and the received vector, the minimum mean square error device producing estimated data, as the applicant has claimed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably

accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Juan A. Torres whose telephone number is 571-272-3119. The examiner can normally be reached on 8-6 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 571-272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Juan Alberto Torres, Examiner  
Art Unit 2611  
04-14-2008  
/Juan A Torres/



Application/Control Number: 10/791,244

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Art Unit: 2611

/Mohammad H Ghayour/

Supervisory Patent Examiner, Art Unit 2611